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AUTHOR Nelson, Linden
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ABSTRACT

The paper details a study supporting the hypothesis that people's opinions about nuclear arms control are influenced by their logically relevant beliefs about nuclear weapons, nuclear war, and the Soviet Union. The hypothesis should not be construed to imply that these beliefs are the only influences or the most powerful influences on arms control opinions for most citizens today. Rather, if most citizens are ambivalent and uncertain about arms control, and are probably also uninformed and uninvolved regarding this issue, their opinions may be strongly influenced by additional variables. Subjects were students (N=188) at the California Polytechnic State University who completed the Nuclear Weapons Policies questionnaire near the beginning of the summer quarter and again near the end of the quarter. (Seventy-two students withdrew or were absent for the second testing.) Three beliefs were shown to relate to opinion about arms control: (1) "Superiority is important"; (2) "Nuclear war is unlikely if the arms race continues"; and (3) "The Soviets are insincere and untrustworthy about arms control." These beliefs appear to function as psychological barriers to supporting arms control. An evaluation of the effects of three educational interventions provided some support for the hypothesis that logically relevant information and arguments may influence people to become more favorable toward arms control proposals. Tables showing attitude scales of the Nuclear Weapons Policies questionnaire, correlations between beliefs and arms control opinion, psychological barriers to arms control, and pre and post treatment means scores and comparisons, and an appendix outlining the psychology of the nuclear arms race conclude the document. (TRS)

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COGNITIVE CONSISTENCY IN BELIEFS ABOUT NUCLEAR WEAPONS

Linden Nelson

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COGNITIVE CONSISTENCY IN BELIEFS ABOUT NUCLEAR WEAPONS

LINDEN NELSON
PSYCHOLOGY AND HUMAN DEVELOPMENT DEPARTMENT
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
SAN LUIS OBISPO, CA 93407

Presented at the Western Psychological Association
Annual Convention, Seattle, Washington
May 3, 1986

This paper presents evidence in support of the hypothesis that people's opinions about nuclear arms control are influenced by logically relevant beliefs about nuclear weapons, nuclear war, and the Soviet Union. First, it is important to recognize the ambivalence and inconsistency in public beliefs and opinions on this issue. For example, in a survey of 188 students at my university in the summer of 1985, 66 percent of students believed that the Soviet Union has primary goals that are incompatible with meaningful arms control. Seventy-six percent believed the Soviets have consistently cheated in major ways on arms control agreements. Yet, more than 75 percent were in favor of arms control treaties with the Soviet Union.

It may seem illogical for a person to favor an arms control treaty with an enemy whose primary goals are believed to be incompatible with arms control. However, the same person who believes that the Soviets can't be trusted may also believe that nuclear war is inevitable if the arms race continues. In that case, it would not be so illogical for the person to favor arms control.

For many people, beliefs that are logically consistent with arms control exist side by side with beliefs that are inconsistent with arms control. These beliefs are not necessarily contradictory, but they have conflicting implications in regard to arms control policy.

People who have some beliefs consistent with arms control and other beliefs inconsistent with arms control are likely to show ambivalence in their responses to questions about arms control opinion. The inconsistency and ambivalence in public opinion about arms control does not prove that people are thinking illogically or that opinions about arms control are unrelated to their beliefs.

The hypothesis that arms control opinions are influenced by logically relevant beliefs should not be construed to imply that these beliefs are the only influences, or the most powerful influences, on arms control opinion for most citizens today. If most of our citizens are ambivalent and uncertain about arms control, and are probably also uninformed and uninvolved regarding this issue, their opinions may be strongly influenced by variables in addition to logically relevant beliefs (Petty & Cacioppo, 1984).

It seems likely, for example, that citizens who are uncertain about arms control may be influenced by social comparison processes. When President Reagan and leading Republicans and Democrats make public statements advocating arms control and nuclear disarmament, citizens may be influenced to

favor arms control. While continuing to hold to some beliefs that are inconsistent with arms control, these citizens express favorable opinions toward arms control on questionnaires. However, their opinions and their efforts in support of arms control are likely to be weak and unstable.

Evidence suggesting that people's opinions about nuclear arms control are related to certain logically relevant beliefs was obtained in a study conducted during the summer of 1985.

PROCEDURE

The subjects were students enrolled in four classes that I taught in Summer Quarter, 1985, at California Polytechnic State University in San Luis Obispo. There were 188 students who completed the Nuclear Weapon Policies Questionnaire (see Table 1) near the beginning of the quarter, and 116 of the students also completed the questionnaire near the end of the ten week quarter. Seventy-two students in the original sample withdrew from class or were absent for the second testing.

Response alternatives (i.e., strongly agree, agree, slightly agree, slightly disagree, disagree, strongly disagree) for questionnaire items 1-19 were assigned values ranging from 6 to 1. The assigned values were reversed for items marked "-" in Table 1.

Scores for various attitude scales were derived from questionnaire items as described in Table 1. For each scale, a subject's score was the sum of scores on relevant items divided by the number of items responded to. A high score on Arms Control Opinion indicates a favorable attitude toward arms control proposals. A high score on Concern About Superiority indicates belief that nuclear weapon superiority is important. A high score on War Probability indicates belief that nuclear war is probable if the arms race continues. Scoring high on Soviet Arms Control Intentions reflects belief that the Soviets would negotiate seriously and comply with arms control agreements.

Test-retest reliability coefficients were computed for the 25 subjects in a control group (i.e., the class that was not exposed to one of the interventions described below in the section "Educational Interventions"). The reliability coefficients (test-retest interval of nine weeks) for the attitude scales used in this study were as follows: Arms Control Opinion, $r = .82$; Concern About Superiority, $r = .75$; War Probability, $r = .63$; Soviet Arms Control Intentions, $r = .87$; all $ps < .001$.

CORRELATIONAL ANALYSIS

Three of the beliefs assessed by the questionnaire were considered by the author to be logically relevant to arms control opinion. The beliefs "nuclear weapon superiority is important," "Soviet arms control intentions are bad" (i.e., insincere, untrustworthy), and "nuclear war is unlikely if the arms race continues" were considered to be logically inconsistent with favoring arms control.

If arms control opinion is influenced by logical thinking, subjects' scores on Arms Control Opinion would be

expected to correlate with their scores on Concern About Superiority, Soviet Arms Control Intentions, and War Probability. The Pearson correlation coefficients reported in Table 2 are based on data obtained from the questionnaires completed at the beginning of the quarter (N = 188). The results show that scores on Concern About Superiority correlated negatively with Arms Control Opinion, and scores on War Probability and Soviet Arms Control Intentions correlated positively with Arms Control Opinion. These correlations are similar to those reported in previous studies (Nelson, 1985; Nelson & Slem, 1984).

The results are consistent with the hypothesis that people's opinions about arms control are influenced by certain logically relevant beliefs. Of course, other possible interpretations about causation are not ruled out by these results.

It is important to notice that the multiple correlation (R = .61) for Concern About Superiority, War Probability, and Soviet Arms Control Intentions as related to Arms Control Opinion predicts only about 37% of the variance in Arms Control Opinion. Even if the logically relevant beliefs identified here do have a causal influence on opinions about arms control, there are probably other beliefs, attitudes, and processes that also have a significant influence on people's opinions about arms control.

For example, studies have found correlations between opinion about nuclear arms control and the following variables: knowledge about nuclear armament (Feshbach, Kandel, & Haist, 1985; Kierulff & Zippin, 1985), nuclear war anxiety (Nelson & Slem, 1984; White & Feshbach, 1984), nationalism (Kosterman & Feshbach, 1986; Larsen, 1985), and values placed on chidren (Feshbach, Kandel, & Haist, 1985). It also seems probable that opinions about nuclear weapon policies are influenced by personality characteristics (Mayton, 1985), faith in technology and in leaders of government (Frank, 1982), psychic numbing (Lifton & Falk, 1982), rationalization (Nelson & Beardsley, 1986), and social influence processes.

PSYCHOLOGICAL BARRIERS TO ARMS CONTROL

Table 3 shows how arms control opinion was related to the number of beliefs, held by a subject, that were considered by the author to be logically inconsistent with favoring arms control. My hypothesis was that these beliefs have a cumulative effect as psychological barriers to arms control.

Using data from the questionnaires completed at the beginning of the quarter (N = 188), fifty-four subjects were categorized as believing "superiority is important" based on scores greater or equal to 4 on the Concern About Superiority scale. For the items in this scale, these subjects at least "slightly agreed" in their average response to statements about the advantages of nuclear weapon superiority.

One hundred and ten subjects were categorized as believing "Soviets intentions are bad" based on scores of less than or equal to 3 on the Soviet Arms Control Intentions scale. These subjects disagreed at least "slightly" with statements claiming that the Soviets want arms control and would comply with arms control agreements.

Ninety-five subjects were categorized as believing "nuclear war is unlikely if the arms race continues" based on scores of less than or equal to 3 on the War Probability scale. These subjects disagreed at least "slightly" with statements claiming that nuclear war is likely if the arms race continues.

Each row in Table 3 represents a different group of subjects. The word "No" in the column below a belief heading indicates nonagreement or absense of that psychological barrier. The word "Yes" indicates agreement with the belief, or the presense of the barrier.

The top row shows that 33 subjects had no beliefs inconsistent with arms control. Mean Arms Control Opinion for these subjects was 4.9. Moving down the table, the next three rows show the frequencies and means for subjects whose beliefs include one, and only one, barrier. They were slightly less favorable toward arms control than subjects with no barriers.

Subjects with two barriers (two beliefs inconsistent with arms control) had mean scores on Arms Control Opinion betwen 3.9 and 4.4. The bottom row shows that for the 24 subjects with three barriers, the mean on Arms Control Opinion was 3.4. These subjects were in between "slightly disagree" and "slightly agree" with arms control proposals.

It may seem strange that subjects with three barriers were not more opposed to arms control. My speculation is that they had other attitudes (not measured) that were consistent with arms control, and they were probably influenced by other factors (e.g., social comparison processes) to believe that arms control proposals have some merit. Perhaps they were in conflict, simultaneously possessing beliefs inconsistent with arms control and other attitudes consistent with arms control.

The results in Table 3 show that the number of beliefs inconsistent with arms control relates to arms control opinion. Of course, this is a correlational analysis which does not provide information about causation. However, the results are consistent with the hypothesis that each of three logically relevant beliefs (i.e., "superiority is important," "Soviet intentions are bad," and "nuclear war is unlikely") functions as a psychological barrier to arms control. This hypothesis deserves further ivestigation in studies using an experimental design.

EDUCATIONAL INTERVENTIONS

In two previous studies (Nelson, 1985; Slem & Nelson, 1985) university students heard lectures providing information and logical arguments designed to challenge the beliefs that nuclear weapon superiority is important, that Soviet arms control intentions are bad, and that nuclear war is unlikely if the arms race continues. Students who heard these lectures became significantly more favorable toward arms control, while students in control groups did not change significantly in arms control opinion.

Three of the classes participating in the study described in this paper were exposed to lectures about the psychology of the nuclear arms race. One general psychology class heard a one hour lecture (Lecture A, see Appendix parts I and II) including

information and concepts relevant to the probability of nuclear war. Another general psychology class heard a one hour lecture (Lecture B, see Appendix parts I - IV) which briefly covered the war probability topic and also included information and logical arguments designed to challenge the belief that nuclear weapon superiority is important and the belief that Soviet arms control intentions are bad. In each case these lectures were given by the author nine days prior to the second administration of the Nuclear Weapon Policies Questionnaire.

A third treatment group (Course) was a social psychology class taught by the author. The lecture part of this class included a unit (6 lectures) on the social psychology of the arms race. These lectures discussed all of the topics included in Lecture B, but in much greater depth.

A fourth class (Control) was considered to be a control group. The control group was enrolled in a personality course, taught by the author, in which nuclear weapon issues were not discussed.

I expected that Lecture A would influence students to become more convinced that nuclear war is probable if the arms race continues. Lecture B and the Course treatments were expected to influence students to become less concerned about nuclear weapon superiority, more positive in their perception of Soviet arms control intentions, and more convinced that nuclear war is probable if the arms race continues. These hypothesized changes were expected to influence students to become more favorable toward arms control proposals. Lecture B should have affected more change in Arms Control Opinion than Lecture A since Lecture B addressed more of the logically relevant beliefs.

Table 4 reports the pre and post treatment mean scores for relevant scales of the Nuclear Weapon Policies Questionnaire. Neither Lecture A nor B resulted in statistically significant changes for War Probability, Concern About Superiority, or Arms Control Opinion. Lecture B, however, influenced students to become more positive about Soviet arms control intentions ($p < .01$), and changes in Arms Control Opinion for the Lecture B group were nearly significant ($p = .09$, two-tailed test) in the predicted direction.

The Course treatment influenced students to be less concerned about superiority ($p < .01$), more positive about Soviet arms control intentions ($p < .01$), and more favorable toward arms control ($p= .05$).

Since Lectures A and B did not result in statistically significant changes in beliefs (except for the effect of Lecture B on Soviet Arms Control Intentions), the results for these treatment groups do not provide much evidence pertaining to the relationship between logically relevant beliefs and opinion about arms control. The results for the Course treatment group demonstrate that interventions which address and change beliefs that are logically relevant to arms control proposals can affect opinion about arms control. It is not clear, however, to what extent these chages in opinion were the result of logically relevant information and argument, as opposed to other characteristics of the lectures or lecturer which may have been persuasive. Further research, comparing interventions of various kinds with control conditions, could help resolve this matter.

CONCLUSIONS

Overall, the study provides evidence of a relationship between people's opinions about nuclear arms control and their logically relevant beliefs about nuclear weapons, nuclear war, and the Soviet Union. Three beliefs (i.e., "superiority is important," "nuclear war is unlikely if the arms race continues," and "the Soviets are insincere and untrustworthy about arms control") were shown to relate to opinion about arms control. These beliefs appear to function as psychological barriers to support for arms control proposals.

An evaluation of the effects of three educational interventons provided some support for the hypothesis that logically relevant information and argument may influence people to become more favorable toward arms control proposals.

ACKNOWLEDGEMENT

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TABLE 1

ATTITUDE SCALES OF NUCLEAR WEAPON POLICIES QUESTIONNAIRE

ARMS CONTROL OPINION

3. The U.S. should negotiate with the U.S.S.R. for a verifiable freeze of all testing, production and deployment of nuclear weapons. (+)

8. It would be unwise for the U.S. to agree to a verifiable 50% reduction in nuclear weapons by both the U.S. and U.S.S.R. (-)

12. The U.S. and U.S.S.R. should agree to ban testing and deployment of defensive weapons on land and in space. (+)

16. It would be desirable to have a treaty to ban all testing of nuclear bombs. (+)

18. We should not sign any nuclear arms control treaty that would prevent us from testing or deploying new weapon systems. (-)

CONCERN ABOUT SUPERIORITY

5. By developing a superiority in nuclear war fighting ability, the U.S. would be able to exercise more control over Soviet behavior in the world. (+)

9. It is not important whether we have more or fewer nuclear weapons than the Soviets. (-)

17. Our ability to effectively deter Soviet aggression requires that we have nuclear forces that are equal to or superior to theirs. (+)

19. Pursuing superiority in nuclear weapons would decrease our ability to negotiate a meaningful arms control agreement with the Soviets. (-)

WAR PROBABILITY

1. There will probably be a major nuclear war in the next thirty years if the arms race continues. (+)

14. Even if the arms race continues, it is very unlikely (less than 5% chance) that there will be an all out nuclear war within the next twenty years. (-)

TABLE 1 CONTINUED

SOVIET ARMS CONTROL INTENTIONS

2. The Soviet Union has primary goals that are incompatible with meaningful arms control. (-)

7. If the Soviets sign a new arms control treaty, they will comply to its requirements. (+)

10. The Soviets have consistently cheated in major ways on arms control agreements. (-)

15. The Soviet leaders will negotiate seriously for meaningful arms control because they want to end the nuclear arms race. (+)

WAR EFFECTS

11. A nuclear war between the U.S. and the U.S.S.R. would cause eventual death for most of our citizens and destroy our economic and political systems. (+)

13. Millions of people in the U.S. and U.S.S.R. would survive the effects of a major nuclear war. (-)

FREEZE IF INFERIOR

4. There should be a nuclear freeze even if it meant that the Soviet Union would maintain a land based intercontinental ballistic missile force that is superior to ours. (+)

STAR WARS

6. U.S. national security could be significantly improved by building a strategic defense ("Star Wars") system for destroying enemy missiles. (+)

WAR WORRY

20. Please circle the response which best indicates how worried you are about the possibility of a nuclear war.

Very worried Quite worried A little worried Not at all worried

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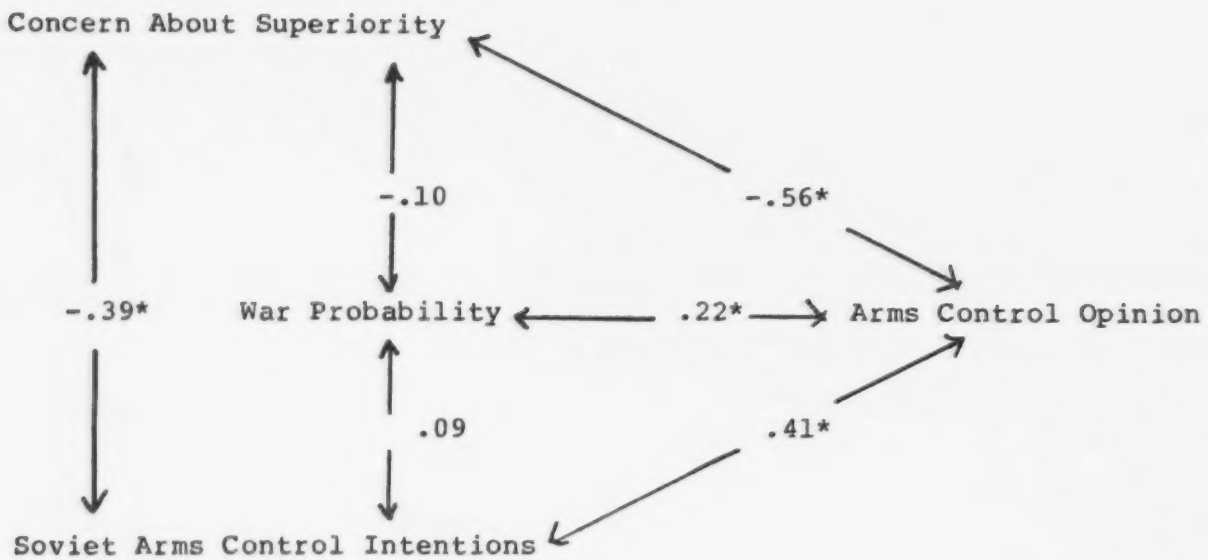
Note: Response alternatives for items 1-19 were: strongly agree, agree, slightly agree, slightly disagree, disagree, strongly disagree

TABLE 2

CORRELATIONS BETWEEN BELIEFS AND ARMS CONTROL OPINION



* $p < .01$

Note: Multiple R for Concern About Superiority, War Probability, and Soviet Arms Control Intentions, as predictors of arms control opinion is .61. N=188.

TABLE 3

PSYCHOLOGICAL BARRIERS TO ARMS CONTROL

BELIEF PATTERN					
Superiority Is Important (N=54)	Soviet Intentions Are Bad (N=110)	Nuclear War Is Unlikely (N=95)	FREQUENCY OF PATTERN (N)	ARMS CONTROL OPINION Mean	SD
No	No	No	33	4.9	.80
Yes	No	No	4	4.6	.81
No	Yes	No	34	4.7	.69
No	No	Yes	37	4.7	.91
Yes	Yes	No	22	3.9	.73
Yes	No	Yes	4	4.2	1.24
No	Yes	Yes	30	4.4	1.11
Yes	Yes	Yes	24	3.4	1.25

Note: Total N=188. Definition of barriers: concern about superiority GE4, Soviet arms control intentions LE3, war probability LE3.

TABLE 4

PRE AND POST TREATMENT MEAN SCORES AND COMPARISONS

	TREATMENT	(N)	PRE MEAN	POST MEAN	t	p
Arms Control Opinion	Control	(25)	4.47	4.37	.74	.47
	Lecture A	(37)	4.29	4.47	-1.51	.14
	Lecture B	(29)	4.43	4.70	-1.78	.09
	Course	(24)	4.69	5.11	-2.05	.05
Concern About Superiority	Control	(25)	3.39	3.50	-.70	.49
	Lecture A	(38)	3.38	3.24	.97	.34
	Lecture B	(29)	2.87	2.95	-.49	.63
	Course	(24)	2.82	2.33	3.15	.00
Soviet Arms Control Intentions	Control	(25)	2.60	2.77	-1.75	.09
	Lecture A	(38)	3.14	3.32	-1.43	.16
	Lecture B	(29)	3.18	3.66	-3.57	.00
	Course	(24)	3.02	4.22	-6.36	.00
War Probability	Control	(25)	3.04	3.52	-2.49	.02
	Lecture A	(37)	3.42	3.45	- .17	.87
	Lecture B	(29)	3.07	3.36	-1.61	.12
	Course	(25)	3.32	3.62	-1.27	.22

All comparisons are t-tests for repeated measures, two-tailed probability.

Treatments: Control (no treatment), Lecture A (covered causes of apathy and probability of nuclear war), Lecture B (covered apathy, war probability, competitive thinking and exaggerated enemy perception as causes of the arms race), Course (included six lectures on topics in Lecture B).

APPENDIX

PSYCHOLOGY OF THE NUCLEAR ARMS RACE

I. Causes of apathy

- A. Defense mechanisms
- B. Low self-efficacy perceptions
- C. Social comparison processes
- D. Remoteness of the danger

II. Is nuclear war likely?

- A. Possibilities
  1. Computer and equipment failure
  2. Human error
  3. Unauthorized use of weapons
  4. Escalation
  5. Preemptive attack
- B. Irrational thinking and behavior
  1. False assumptions
  2. Deficient value systems
  3. Effects of stress and anger
  4. Behavior disorders - drug abuse, brain damage, paranoia

III. Psychological causes of the nuclear arms race

- A. Motivation to defend national interests and to deter aggression
  1. Deterrence - preventing aggression by threatening to punish the potential aggressor
  2. Can deterrence be improved?
- B. Overgeneralization of competitive thinking
  1. Evidence
  2. Examples
  3. What causes overgeneralization?
- C. Exaggeration of enemy perceptions
  1. Evidence
  2. Examples
  3. What causes this exaggeration?
     -- Motivation for cognitive consistency
     -- Conceptually guided perception
     -- Egocentric bias
     -- Fundamental attribution error
     -- Emotional reinforcement
- D. Rationalization by influential political and economic groups

IV. Ending the arms race would require:

- A. Avoiding overgeneralization and exaggeration
- B. Recognizing that national security depends on cooperation
- C. Negotiating for verifiable agreements to cease testing and deployment of new weapons